Effect of extraction parameters on the yield of betacyanins from pitaya fruit (Hylocereus polyrhizus) pulps

ABSTRACT

Red pitaya fruit is considered a potential source of betacyanins, a red-violet natural food colouring agents, but pitaya processing into colouring foodstuff still remained difficult due to its low yield of juice during extraction.The present study hence, was aimed at assessing the effect of extraction parameters on the yield of natural colorant from red pitaya fruit (Hylocereus polyrhizus) pulp. Distilled water was used as solvent and the parameters studied were the temperature (30 to 90°C), time (5 to 20 min) and pH (1 to 7). The concentration of total betacyanins was measured by a spectrophotometer and was used as a measure of the degree of extraction. The colour was analysed by measuring colour parameters like lightness (L*), hue angle (a*) and chroma (c*) using a colourimeter. Single factor statistical analysis showed that all extraction conditions had significant effect (<0.05) on the yield of betacyanin. The highest betacyanin concentration was obtained by heating pulp at 70°C for a period of 5 min using distilled water at pH 6. A comparison of the yield of betacyanin from pitaya fruit pulp at optimized conditions with that of rather different conditions (temperature 30°C, pH 6 and time 5 min) resulted in lower yield of betacyanin and the results were significantly different at <0.05. Although the method is straightforward of obtaining the optimal parameters for the extraction process of pitaya pulp, the results obtained can readily be used in screening of extraction parameters and selecting the levels of independent variables employed in response surface optimization.

Keyword: Pitaya; Betacyanins; Betalain; Lightness; Chroma; Hue angle; Citric acid; Aqueous extraction